

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

Claim 1. (Previously Presented) A method to generate a preamble sequence in an orthogonal frequency division multiplexing (OFDM) communication system having a plurality of subcarriers actually in use and identified by unique numbers in a frequency domain, the method comprising the steps of:

generating a first short preamble sequence with elements corresponding to the plurality of subcarriers, wherein data other than null data is inserted for elements associated with a subcarrier identified by a unique number that is an even number;

generating a second short preamble sequence with elements corresponding to the plurality of subcarriers, wherein data other than null data is inserted for elements associated with a subcarrier identified by a unique number that is an odd number; and

generating a preamble sequence in a time domain by transforming one of the first and second short preamble sequences according to a transmission rule by using an inverse Fast Fourier transform.

Claim 2. (Previously Presented) The method of claim 1, wherein a peak-to-average power ratio (PAPR) is decreased through at least two antennas in the OFDM communication system.

Claim 3. (Previously Presented) The method of claim 1, wherein the first-short preamble sequence is adapted to be transmitted via one of at least two antennas.

Claim 4. (Previously Presented) The method of claim 3, wherein the second short preamble sequence is adapted to be transmitted via one of at least two antennas.

Claims 5-8 (Canceled)

Claim 9. (Previously Presented) The method of claim 1, wherein the second short preamble sequence is  $P_g(-100:100)$  and is defined as

$$P_g(-100:100) = \{ \begin{array}{l} 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, \\ 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, \\ 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, \\ 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, \\ 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, \\ 0, -1, \\ 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, 0, -1, \\ 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, \\ 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, \\ 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, \\ 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0 \} \\ \cdot \sqrt{2} \cdot \sqrt{2} \end{array}$$

Claim 10. (Previously Presented) The method of claim 1, wherein the first short preamble sequence is  $P(-100:100)$  and is defined as

$$P(-100:100) = \{ \begin{array}{l} -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, \\ -1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, \\ -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, \\ -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, \\ -1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, \\ 0, 0, \\ -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, \\ +1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, \\ -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, \\ -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, -1, 0, -1, 0, \\ -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1 \} \\ \cdot \sqrt{2} \cdot \sqrt{2} \end{array}$$

Claim 11. (Previously Presented) An apparatus to generate a preamble sequence in an orthogonal frequency division multiplexing communication system having a plurality of subcarriers actually in use and identified by unique numbers in a frequency domain, the apparatus comprising:

a first antenna preamble sequence generator to generate a first short preamble sequence with elements corresponding to the plurality of subcarriers, wherein data other

than null data is inserted for elements associated with a subcarrier identified with a unique number that is an even number;

a second antenna preamble sequence generator to generate a second short preamble sequence with elements corresponding to the plurality of subcarriers, wherein data other than null data is inserted for elements associated with a subcarrier identified with a unique number that is an odd number; and

an inverse fast Fourier transform (IFFT) processor to generate a preamble sequence in a time domain by transforming one of the first and second short preamble sequences according to a transmission rule by using an IFFT.

Claim 12. (Previously Presented) The apparatus of claim 11, wherein the second short preamble sequence is  $P_g(-100:100)$  and is defined as

$$\begin{aligned} P_g(-100:100) = & \{ 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, \\ & 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, \\ & 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, \\ & 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, \\ & 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, \\ & 0, -1, \\ & 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, -1, 0, -1, \\ & 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, \\ & 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, \\ & 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, \\ & 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0 \} \\ & * \sqrt{2} * \sqrt{2} \end{aligned}$$

Claim 13. (Previously Presented) The apparatus of claim 11, wherein the first short preamble sequence is  $P(-100:100)$  and is defined as

$P(-100:100) = \{$ 
  
 $-1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0,$ 
  
 $-1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0,$ 
  
 $-1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0,$ 
  
 $-1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0,$ 
  
 $-1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0,$ 
  
 $0, 0,$ 
  
 $-1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0,$ 
  
 $+1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0,$ 
  
 $-1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0,$ 
  
 $-1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, -1, 0, -1, 0, -1, 0,$ 
  
 $-1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1\}$ 
  
 $\cdot \sqrt{2} \cdot \sqrt{2}$

Claims 14-18 (Canceled)